

APPLICANT(S): SPIEGEL, Solon J. et al.  
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### AMENDMENTS TO THE CLAIMS

Please add or amend the claims to read as follows, and cancel without prejudice or disclaimer to resubmission in a divisional or continuation application claims indicated as cancelled:

1. (Currently amended) An apparatus comprising:

a first filter having a programmable number of poles operably coupled to an input of a buffer;

a second filter having a programmable number of poles operably coupled to an output of the buffer; and

a programmable convolver operably coupled to an output of the second filter and ~~able a baseband module adapted to filter a received signal of a wireless communication system, wherein by programming an impulse response of the a filter to a programmable convolver is programmed based on wireless communication system type information included in a characteristic of the received signal.~~

2. (Currently amended) The apparatus of claim 1, ~~wherein the baseband module further comprises comprising:~~

a memory to store the impulse response ~~of the filter;~~ and

a digital to analog converter (DAC) to provide a time phase of a stored impulse response ~~of the filter~~ to the programmable convolver.

3. (Currently amended) The apparatus of claim 2, ~~wherein the baseband module further comprises comprising:~~

an automatic gain control to control an output signal level of the programmable convolver.

4. (Canceled).

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5. (Currently amended) The apparatus of claim 2, wherein a resolution of the digital to analog converter and a sampling rate of the digital to analog converter are set according to the modulated received signal characteristic characteristics.

6. (Currently amended) The apparatus of claim ~~[[4]]~~ 1, wherein a length of the impulse response is set according to the modulated received signal characteristic characteristics.

7. (Currently amended) The apparatus of claim ~~[[2]]~~ 1, further comprising:  
an amplifier operably coupled to an output of the programmable convolver; and  
a second digital to analog converter operably coupled to the output of the amplifier.

8. (Currently amended) The apparatus of claim ~~[[4]]~~ 2, wherein the memory comprises ~~[[an]]~~ two or more impulse response responses of a first filter and an impulse response of a second filter, and wherein the impulse response of the programmable convolver is programmed with one of the impulse response of the first filter and the two or more impulse responses response of the second filter according to the characteristic of modulated the received signal characteristics.

9. (Currently amended) The apparatus of claim ~~[[4]]~~ 1, wherein the programmable convolver is a complex programmable convolver.

10. (Currently amended) The apparatus of claim ~~[[4]]~~ 1, wherein the ~~filter is a~~ programmable convolver ~~having~~ includes an analog output.

11. (Currently Amended) An apparatus comprising:  
a ~~multi-mode~~ receiver able to receive signals of from two or more wireless communication systems, wherein the receiver is adapted to switch between baseband demodulation modes by programming the receiver having a baseband module based on

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~~wireless communication system type information included in a received signal including an in-phase (I) channel to filter an I signal of the received signal and a quadrature (Q) channel to filter a Q signal of the received signal, wherein both the I and Q channels include a first filter having a first programmable frequency response, the first filter being operably coupled to an input of a buffer, and a second filter having a second programmable frequency response, the second filter being operably coupled to an output of the buffer and to an input of a programmable convolver; and~~

~~a memory to store a first impulse response and a second impulse response to program a of the baseband module.~~

12. (Currently Amended) The apparatus of claim 11, ~~wherein the baseband module comprises~~ comprising:

a memory to store the first programmable impulse response and the second programmable impulse response to program the first and second filters, respectively  
~~an in-phase (I) channel to filter an I signal of the received signal and a quadrature (Q) channel to filter a Q signal of the received signal.~~

13. (Canceled).

14. (Currently Amended) The apparatus of claim ~~[[13]]~~ 11, wherein ~~the both the I and Q channels comprise~~ channel further comprises:

digital to analog converters (DACs) operably coupled to the programmable convolver, wherein the DACs ~~comprise~~ have an adjustable sampling rate and an adjustable resolution.

15. (Currently Amended) The apparatus of claim ~~[[14]]~~ 11, wherein ~~the both the I and Q channels comprise~~ channel further comprises:

an automatic gain control operably coupled to the programmable convolver to control a signal level of the programmable convolver and to provide an average amplitude level at the programmable convolver output.

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16. (Canceled).

17. (Canceled).

18. (Canceled).

19. (Currently Amended) The apparatus of claim [[12]] 11, wherein the ~~multi-mode~~ receiver is a direct conversation multi-mode receiver.

20. (Currently Amended) The apparatus of claim 12, wherein the I channel and the Q channel comprise programmable complex ~~convolvers~~ convolvers.

21. (Currently Amended) The apparatus of claim 13, wherein the first filter and the second filter are programmable ~~convolvers~~ convolvers.

22. (Currently Amended) The apparatus of claim 16, wherein the first filter and the second filter are programmable ~~convolvers~~ convolvers.

23. (Currently Amended) A method of selecting a mode of a multi-mode receiver comprising:

receiving a signal;

programming a first programmable frequency response of a first filter according to a characteristic of the received signal and filtering the received signal to provide a first filtered signal;

buffering the first filtered signal to provide a buffered signal

programming a second programmable frequency response of a second filter according to a characteristic of the received signal and filtering the buffered signal to provide a second filtered signal; and

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programming a programmable convolver with an impulse response of a filter based on ~~wireless communication system type information included in a~~ the characteristic of the received signal and filtering the second filtered signal.

24. (Currently Amended). The method of claim 23, further comprising:  
setting the first and second programmable ~~[[a]]~~ frequency ~~[[response]]~~  
~~responses of a filter by modifying the structure of the filter and~~ setting first and  
second the number numbers of poles to the first and second filters, respectively  
~~of the filter.~~
25. (Currently Amended). The method of claim ~~[[24]]~~ 23, further comprising:  
setting a sampling rate and a resolution to a digital to analog converter to  
switch between receiving modes of the multi-mode receiver.
- 26 (Currently Amended) The method of claim 25, further comprising:  
setting a length of the impulse response according to the characteristic of ~~[[a]]~~  
the received signal characteristic.
27. (Original). The method of claim 26, further comprising:  
providing a combined analog and digital gain control to control a signal level  
of the programmable convolver.